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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,678	01/20/2004	Andrew J. Ouderkirk	58388US004	5265
32692 7590 06/12/2007 3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			EXAMINER LOUIE, WAI SING	
			ART UNIT 2814	PAPER NUMBER
			NOTIFICATION DATE 06/12/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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LegalDocketing@mmm.com

Office Action Summary	Application No. 10/762,678	Applicant(s) OUDERKIRK ET AL.	
	Examiner Wai-Sing Louie	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 8, and 11-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Singer et al. (US 5,813,752).

With regard to claims 1-4, Singer et al. disclose a light-emitting device (LED) with phosphor converter and Perot filter (col. 2, line 66 et seq. and fig. 1), comprising:

- An LED 44 capable of emitting light (fig. 3);
- A layer of phosphor material 48 has a major surface positioned to receive excitation light and emitting visible light when illuminated with the excitation light (col. 4, line 47 and fig. 3);
- Interference reflector means 50 positioned to reflect at least some light emitted by the LED 44 that has not passed through the layer of phosphor material 48, onto the major surface layer of phosphor material 48 and transmitting at least some visible light emitted by the phosphor (col. 4, lines 51-54 and fig. 3).

With regard to claims 5, 12, Singer et al. disclose the reflector 50 has a planar shape (fig. 3).

With regard to claim 8, Singer et al. disclose a first portion of the light emitted by the LED is reflected by the reflector 50 onto a major surface of the layer of phosphor material 48, and a second portion of the light emitted by the LED impinges on a second major surface of the layer of phosphor material 48 opposed to the first major surface (fig. 3).

With regard to claim 11, Singer et al. disclose the layer of phosphor material 48 is segmented into distinct color region (col. 2, lines 35-41).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-7, 9, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al. (US 5,813,752) in view of Lin et al. (US 6,864,554).

With regard to claims 6-7, 9, and 13, Singer et al. do not disclose the reflector has a non-planar, or ellipsoid shape, or a shape of revolution, or not co-planar with the LED. However, Lin et al. disclose the reflective surface 232 is curved (non-planar) or convex (ellipsoid) shaped (col. 9, lines 1-9 and fig. 5-6). Lin et al. teach the shaped reflective surface changes the angle of reflection and could increase the range of light emitted (col. 9, lines 9-13). Thus, it would have been obvious at the time the invention was made to modify Singer's device with the teaching of

Lin et al. to provide a non-planar, or ellipsoid shaped reflector in order to change the angle of reflection and could increase the range of light emitted.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al. (US 5,813,752) in view of Lowery (US 5,959,316).

With regard to claim 10, Singer et al. do not disclose the layer of phosphorus material 48 surrounds the LED 44. However, Lowery discloses a layer of phosphor material 66 surrounds the LED 60 (Lowery fig. 4). Lowery teaches the hemispherical shape phosphor material 66 does not allow any residual blue light emitted by the LED 60 to escape past the phosphor material (Lowery col. 1, lines 18-26). Therefore, it would have been obvious to one of ordinary skill in the art to modify Singer's device with the teaching of Lowery to provide a hemispherical shape phosphor material surrounds the LED in order to eliminate any residual blue light emitted by the LED 60 to escape past the phosphor material.

Claims 14-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al. (US 5,813,752) in view of Takahashi (US 6,717,348).

With regard to claims 14, 18-19, and 21, Singer et al. do not disclose the layer of phosphor material is discontinuous layer of phosphor material. However, Takahashi discloses a layer prima facie case of obviousness discontinuous layer of phosphor material (Takahashi fig. 3). Takahashi teaches the discontinuous layer of phosphor material could comprise red, blue, and green to form a full-color display (Takahashi col. 5, lines 28-43). Thus, it would have been obvious at the time the invention was made to modify Singer's device with the teaching of

Takahashi to provide a discontinuous layer of phosphor material in order to have a full-color display.

With regard to claims 15-16, Singer et al. modified by Takahashi disclose a pattern of phosphor material or a plurality of dots of phosphor material (Takahashi col. 5, lines 36-43).

With regard to claim 17, Singer et al. modified by Takahashi do not disclose the plurality of dots of phosphor material each have an area of less than 10000 micron². However, the surface area of the dots is considered to involve routine optimization, which has been held to be within the level of ordinary skill in the art. As noted in *In re Aller*, the selection of reaction parameters such as surface area etc. would have been obvious:

“Normally, it is to be expected that a change in temperature, or in thickness, or in time, would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art...such ranges are termed “critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”

In re Aller 105 USPQ233, 255 (CCPA 1955). See also *In re Waite* 77 USPQ 586 (CCPA 1948); *In re Scherl* 70 USPQ 204 (CCPA 1946); *In re Irmischer* 66 USPQ 314 (CCPA 1945); *In re Norman* 66 USPQ 308 (CCPA 1945); *In re Swenson* 56 USPQ 372 (CCPA 1942); *In re Sola* 25 USPQ 433 (CCPA 1935); *In re Dreyfus* 24 USPQ 52 (CCPA 1934).

Therefore, one of ordinary skill in the requisite art at the time the invention was made would have used any surface area suitable to the method of the process in order to optimize the design.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Singer et al. (US 5,813,752) in view of Steklenski et al. (US 6,652,996).

With regard to claim 20, Singer et al. do not disclose the reflector comprises alternating layers of a first and second thermoplastic polymer where at least some of the layers are birefringent. However, Steklenski et al. disclose a multi-layer polymeric reflector having birefringent alternating layers (Steklenski col. 10, lines 1-8). Steklenski et al. teach the polymeric multi-layer reflector provides uniform reflection across visible wavelength as well as ultraviolet and infrared regions (Steklenski col. 8, lines 30-41). Therefore, it would have been obvious for the one with ordinary skill in the art to modify Singer's device with the teaching of Steklenski et al. to provide a polymeric multi-layer reflector in order to provide a uniform reflection across visible wavelength.

Response to Arguments

Applicant's arguments filed 3/20/2007 have been fully considered but they are not persuasive.

- Applicant states the "interference reflector means" of that claim performs two functions: (1) it reflects at least some light emitted by the LED that has not passed through the layer of phosphor material, onto the layer of phosphor material, and (2) it transmits at least some visible light emitted by the phosphor. Singer et al. teach the phosphor layer 48 is made of phosphor gains, where the phosphor gain density and size should be high enough to ensure that most of the light emitted from the LED be converted to visible light (col. 3, lines 38-44). However, some of

the light emitted passes through the phosphor layer without converted into visible. Singer et al. install a long-wave pass (LWP) filter 50, which is made of multi-layered dielectric stacks to reflect the un-converted light back to the phosphor layer 48 and transmits the converted light through the LWP filter 50 (col. 4, lines 51-57 and fig. 3). Thus, Singer et al. fulfill the two functions stated by the applicant and Singer et al. meet the claimed "interference reflector means" in claims 1 to 3.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (571) 272-1709. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



WAI-SING LOUIE
PRIMARY PATENT EXAMINER

Wsl
June 5, 2007.